The development and adjustment of 7-year old children adopted in infancy.

Stams, G.J.; Juffer, F.; Rispens, J.; Hoksbergen, R.A.C.

published in
Journal of Child Psychology and Psychiatry
2000

DOI (link to publisher)
10.1017/S0021963099006344

document version
Publisher's PDF, also known as Version of record

J. Child Psychol. Psychiat. Vol. 414141, No. 8, pp. 1025–1037, 2000
Cambridge University Press

0021–9630/00 $15.00 + 0.00

The Development and Adjustment of 7-year-old Children Adopted in Infancy

Geert-Jan J. M. Stams and Femmie Juffer
Leiden University, The Netherlands

Jan Rispens and René A. C. Hoksbergen
Utrecht University, The Netherlands

The present study ($N = 159$) provides evidence of an increased risk for behavior problems of infant-placed 7-year-old internationally, transracially adopted children in the Netherlands. However, parents reported more behavior problems for adopted boys than for adopted girls. Notably, about 30% of the adopted children were classified as clinical on the CBCL scale for total problems, which is a much larger percentage than the 10% found in the normative population. It was suggested that these results could be explained by the operation of multiple risk factors before and after adoption placement, e.g. the child's genetic disposition, pre-natal and pre-adoption care, or the child's cognitive understanding of adoption in middle childhood. Also, results suggest that maternal sensitive responsiveness in adoptive families declines in the transition from early to middle childhood. In contrast to the home setting, the adopted children showed favorable behavioral and socioemotional adjustment at school, while their academic achievement and intelligence were in the normal range or above average. In particular Korean children had high IQs: 31% of these children obtained an intelligence score above 120. It was suggested that adoptive parents seem to offer their children sufficient or even more than average cognitive stimulation. Furthermore, adopted girls scored higher in optimal ego-control, social competence, and peer group popularity than nonadopted girls from the general population: 30% of the adopted girls were rated as popular by their classmates, which compares favorably to the 13% found in the general school population.

Keywords: Adoption, behavior problems, Child Behavior Checklist, follow-up studies, school children, sociometrics.

Abbreviations: CBCL: Child Behavior Checklist; CCQ: California Child Q-set; EAS: Emotional Availability Scales; RACIT: Revised Amsterdam Child Intelligence Test; SCHOAL: School Behavior Assessment List; TRF: Teacher's Report Form; WISC-R: Wechsler Intelligence Scale for Children-Revised.

Introduction

Adoption provides the natural context for studying the influence of changing child-rearing environments on the development of children. Several studies have shown that adoptive placement can radically change the course of the child's developmental path. For instance, Rutter et al. (1998) found a dramatic recovery in adopted children from Romania at age 4 after severe early deprivation in Romanian orphanages. Here, adoption functions as a protective factor, as adoptive parents offer children the essential resources to overcome serious developmental retardation. Nevertheless, there is cause for concern too, as recent studies report rather high adoption disruption rates, and show that adoptees have elevated rates of behavior problems compared to their nonadopted peers, and are overrepresented in mental health settings (for reviews see Berry, 1992; Festinger, 1990; Haugaard, 1998; for a meta-analysis see Wierzbicki, 1993).

Haugaard (1998), however, cautions that the risk associated with adoption should not be overestimated. First, research findings should be interpreted with care if adopted children with different histories are considered together. Second, research using nonclinical samples seems to be far from conclusive. Moreover, such differences as are found tend to be small (see also Sharma, McGue, & Benson, 1996). Third, adoptees may be overrepresented in mental health settings because of a selection bias in the referral of adopted children (Warren, 1992). Fourth, adoption may not be pathogenic in itself, that is, a stressful experience that negatively affects the adjustment of most adoptees, as differences between groups of adopted and nonadopted children often reflect the presence of some severely disturbed children, namely, children with extremely adverse pre-placement histories. Haugaard contends that differences in mean adjustment scores between adopted and nonadopted children, or proportions of deviant adoptees in general or clinical population samples, do not settle the question whether or

Correspondence should be addressed to: Dr F. Juffer, Center for Child and Family Studies, Leiden University, PO Box 9555, 2300 RB Leiden, The Netherlands
(E-mail: juffer@fsw.leidenuniv.nl).

not adoption could have the hypothesized general negative influence. To answer this question, it is imperative that distributions of adjustment scores be examined, and that information be obtained concerning adopted children's pre-placement histories.

From a theoretical point of view, Brodzinsky (1987) has argued that adoption in itself can be considered as a psychological stressor that may negatively affect the child's adjustment. According to Brodzinsky adoption always involves loss. Many adoptive parents experience a sense of loss associated with their infertility, while adopted children experience the loss of their biological parents and origins. Brodzinsky states that these losses can lead to emotional and behavioral reactions associated with grieving. Also, empirical evidence points to a higher incidence of behavior problems in adoptees, even in adolescents adopted as young infants (Verhulst, Althaus, & Versluis-den Bieman, 1990).

Whereas adoption creates a situation in which a child's life takes a dramatic turn, age 7 marks a psychological turn in the development of adopted children. Between the ages of 5 and 7 adopted children begin to understand the implications of being adopted (Brodzinsky, Singer, & Braff, 1984). At the same time, they enter a wider social world that may emphasize their adoptive status. During the school-age years, even more than in early childhood, the adoptive family is likely to experience the inherent differences of adoption. As such, middle childhood seems to entail new problems that could affect the relationships in the adoptive family, and the adopted children's development and adjustment (Smith & Brodzinsky, 1994).

In the present longitudinal, prospective study we examine the adjustment of 7-year-old internationally, transracially adopted children in the Netherlands, placed before 6 months of age ($N = 159$). In the Netherlands adoption predominantly consists of international placements—700 to 800 annually—while domestic placements are rare. Most internationally adopted children are foundlings or have been relinquished by their biological mother. Therefore, they have experienced at least one major separation. Additionally, these children often have histories of neglect, abuse, malnourishment, and understimulation (Juffer, 1993). Although in general these intercountry adoptions are evaluated positively as a second chance for a child in need of parents, an increasing awareness of the psychological problems of adoptive families has grown in society (Hoksbergen, 1997). Also, racial discrimination is a problem for some families. According to self-report, 19% of 15- to 17-year-old adoptees from Thailand ($N = 68$) experienced discrimination, whereas twice as many of their parents (38%) thought that their child experienced discrimination (Geerars, Hoksbergen, & Rooda, 1995).

Although the children in this study were placed at an early age, we hypothesize that the risks associated with adoption in general, and more specifically in middle childhood, will result in lower levels of adjustment in the following domains: behavior problems, social development, and personality development. As the inherent differences of adoption may be more salient at school than at home, we hypothesize that adopted children's adjustment will be lower in the school than in the home context. Since there is no evidence for an increased risk of lower intelligence in infant-placed adoptees without medical risk (Wadsworth, DeFries, & Fulker, 1993), we expect intelligence scores to be in the normal range.

The present study is not restricted to the adjustment of adopted children. Notably, it has been established that the socioemotional and behavioral adjustment of children can be influenced by supportive parenting (e.g. Egeland, Carlson, & Sroufe, 1993). Therefore, we will examine differences in parent–child interaction between adoptive and biological families, focusing on the aspect of maternal sensitive responsiveness.

Method

Participants

The present study examines the development and adjustment of 159 adopted children at age 7 years. The largest group, 129 adopted children, was selected from 2 studies, starting when the child was aged 5 months. In these studies a short-term early intervention was implemented in three sessions at home between 6 and 9 months in an experimental group, and results were compared with a control group. The families for this experiment were randomly recruited through Dutch adoption organizations, and not selected on (future) problems. Also, to avoid selection, the parents were not aware of the intervention when they entered the study. They were requested to participate in a study examining the development of adopted children. The results of the intervention study were reported elsewhere (Juffer, Hoksbergen, Riksen-Walraven, & Kohnstamm, 1997; Stams, Juffer, Van IJzendoorn, & Hoksbergen, in press). The intervention was not repeated during the following years. The original studies involved 70 mixed families, i.e., adoptive families with biological children, and 90 all-adoptive families, i.e., adoptive families without biological children. As intervention effects were found at age 7 in a small intervention group of 20 mixed families (Stams et al., in press), we decided to omit this group from the present study. The remaining sample consisted of 55 intervention and 74 control families. An additional group of 30 families, matched on the original criteria, was randomly recruited from one adoption agency at age 7, serving as a post-test-only group. The absence of intervention or testing effects on any of the outcome measures was confirmed in preliminary analyses, contrasting intervention with control groups, and control groups with the post-test-only group recruited at age 7, respectively.

The adoptive parents were Caucasian white, and in all families the mother was the primary caregiver. The families were predominantly from middle-class or upper middle-class backgrounds. The attrition rate was 8%, that is, 11 of 140 participants from the original studies. The major reasons for declining were disinterest or health problems of family members. Four mothers had died of incurable illnesses. A series of separate Bonferroni-corrected statistical tests confirmed the absence of differential attrition in the total sample with respect to child background variables, such as age at placement, and family background variables, such as socioeconomic status or family type (with or without biological children).

The children, 73 boys and 86 girls, were adopted from Sri Lanka ($N = 108$), South Korea ($N = 37$), and Colombia ($N = 14$). The infants from Sri Lanka were in the care of their biological mother until their adoption placement at a mean age of 7 weeks ($SD = 3$). Korean and Colombian infants stayed in an institution or foster home after separation from their biological mother at birth, until their adoption placement at a mean age of 15 weeks ($SD = 4$). In comparison with adoptions from Romania, for example (O'Connor et al., 2000; Rutter et al., 1998), the material conditions in the Korean and Colombian institutions were relatively favorable, as these homes received substantial support from a Dutch adoption agency. However, little is known about the quality of care, whereas one may assume that frequent changes of caretakers and nonoptimal child–caretaker ratios, often found in institutions, resulted in less favorable socioemotional conditions

(O'Connor, Bredenkamp, Rutter, & the ERA Study Team, 1999). Little is known about the child-rearing conditions of the Sri Lankian infants after birth. Based on anecdotal evidence from parent reports, pre- and post-natal care for the relinquishing mother and her baby were far from optimal in Sri Lanka, and the health condition of the mother was deplorable in many cases (Juffer, 1993).

Design

Mother–child dyads from two prospective studies were longitudinally followed during a 7-year period. At age 7, we examined adopted children's adjustment in comparison to children from the normative, general, and clinical population in four major developmental domains: social development, personality development, cognitive development, and behavior problems. In order to compare maternal sensitive-responsive behavior in adoptive and nonadoptive mothers, a group of mothers with 7-year-old biological children was randomly sampled from four large elementary schools with a middle-class population in a representative Dutch town. This group was successfully matched on sex, age, ordinal position of the child, socioeconomic status, and family size. However, adoptive mothers proved to be slightly older than nonadoptive mothers, $t(204) = 4.18$, $p < .001$, with mean ages of 40 and 37 years, respectively. The response rate in the group of nonadoptive mothers was 70%. The reasons for not participating pertained to lack of time, disinterest, and moving.

Procedures

At the previous measurement points, 129 adoptive mother–child dyads were visited at home (5, 6, and 12 months) and came to the laboratory (12, 18, and 30 months). At age 7 years, 159 adoptive families were visited at home to observe mother–child interaction, to interview the mother, to administer questionnaires to her, and to assess the child's intelligence. Also, valid school data were obtained for 149 adopted children: classmates were interviewed, and questionnaires were completed by the focal child's teacher.

Measures

The child's competencies, school behavior, and behavior problems were assessed with questionnaires, while personality development was assessed with a Q-sort. The child's peer group popularity was assessed with a sociometric measure, and intelligence was assessed with a standardized procedure. The adoptive mother's sensitive responsiveness was videotaped at home and assessed by means of a rating strategy. The statistics on the reliability and validity of measures were based on the total sample, i.e., all groups from the original studies, including the omitted intervention group ($N = 176$). In the case of sensitive responsiveness, statistics were based on the pooled sample of adoptive families and the comparison group of 30 biological families ($N = 206$).

Behavior problems and competence. The Child Behavior Checklist (CBCL) and Teacher's Report Form (TRF) were administered to the mother and teacher of the child involved. Both are standardized procedures to assess the child's behavior problems and competence. Evidence for satisfactory reliability and good validity of both instruments can be found in Achenbach (1991a, b), Verhulst, Van der Ende, and Koot (1996, 1997), and Verhulst, Koot, and Van der Ende (1994).

The CBCL and TRF provide cutoff scores to distinguish deviant from nondeviant scoring children. On the basis of these criteria, it is possible to determine percentages of children falling in the borderline clinical and clinical range. Whereas children in the borderline clinical range may show serious behavior problems, the incidence of behavior problems in children exceeding the clinical cutoff criterion is likely to equal the incidence of behavior problems in children who have been referred to clinical settings. We used cutoff points that were based on a sample of 2227 children between age 4 and 18, drawn from the Dutch general population in 1993 (Verhulst et al., 1996, 1997). For internalizing, externalizing, and total problems, the 82nd and 90th percentile of the cumulative frequency distribution were used to define the cutoff points for the borderline clinical and clinical range, respectively. For the specific syndrome scales, the 95th and 98th percentile were used as cutoff criteria (Verhulst et al., 1996, 1997). In the present study, we will make comparisons between adopted children and children from the normative, general, and clinical population.

Both the CBCL and TRF contain 118 problem items, which are scored on similar 3-point scales. Mothers and teachers indicated whether behavioral descriptions were (0) not at all true, (1) somewhat true, or (2) very true of their child. We thus obtained scores on the following narrow-band syndrome scales: withdrawn, somatic complaints, anxious/depressed, delinquency, aggression, social problems, thought problems, attention problems, and sex problems. Except for sex problems (Cronbach's alpha = .37), all reliabilities were satisfactory. The scale for sex problems was not included in further analyses. We obtained scores for the broad-band syndromes externalizing (CBCL $\alpha = 91$; TRF $\alpha = .95$), and internalizing behavior (CBCL $\alpha = .84$; TRF $\alpha = .88$). The alphas were somewhat lower for the internalizing narrow-band syndrome scales, ranging from $\alpha = .59$ (withdrawn-CBCL) to $\alpha = .89$ (anxious/depressed-TRF) than for the externalizing narrow-band syndrome scales, ranging from $\alpha = .64$ (delinquency-CBCL/TRF) to $\alpha = .94$ (aggression-TRF). Also, scores for total problems were computed (CBCL $\alpha = .94$, TRF $\alpha = .96$).

To measure adaptive functioning at school (TRF), teachers indicated on 7-point scales the degree to which children behaved appropriately, showed progress in learning, etc. A score for academic performance (TRF) was obtained by averaging teacher ratings for six academic subjects. The reliabilities for adaptive functioning at school and academic performance were $\alpha = .74$ and $\alpha = .92$, respectively. As the competence scales of the CBCL were not reliable, all analyses were completed with the TRF competence scales only.

School behavior. The School Behavior Assessment List (SCHOAL), version A, was used to assess socioemotional behavior at school. The good reliability and validity of the SCHOAL was established by Bleichrodt, Resing, and Zaal (1993). The SCHOAL consists of 52 items, each of 6 points, with pairwise comparisons of opposite adjectives that describe personality characteristics. Four scales can be derived from these items: attitude towards work ($\alpha = .93$), agreeableness ($\alpha = .86$), emotional stability ($\alpha = .79$), and extroversion ($\alpha = .89$). The raw scores obtained on the SCHOAL were transformed to standardized scores with a mean of 10 and *SD* of 3. These standardized scores are based on a representative sample of 397 children between age 4 and 11, drawn from the general school population in the Netherlands (Bleichrodt et al., 1993).

Personality development. The California Child Q-set (CCQ) consists of 100 items, printed on individual cards, providing descriptions of behavioral, affective, and cognitive characteristics of children (Block & Block, 1980; Van Lier, Haselager, Hoeben, & Van Lieshout, 1992; Van Lieshout et al., 1986). Mothers and teachers were asked to sort the items into a forced, quasi-normal, nine-category distribution that ranges from (1) extremely uncharacteristic to (9) extremely characteristic of the child being described. Scale scores were calculated on the basis of item-content, factor analysis, internal consistencies, and Q-sorts by clinical experts (Van Lier et al., 1992). The scales include: ego-resiliency ($\alpha = .76$); ego-brittleness ($\alpha = .70$); ego-overcontrol ($\alpha = .69$); ego-undercontrol ($\alpha = .65$); creativity ($\alpha = .68$); prosocial competence ($\alpha = .87$); antisocial competence ($\alpha = .82$); depression ($\alpha = .66$); self-esteem ($\alpha = .60$); social esteem ($\alpha = .52$); and vitality ($\alpha = .72$). As the reliability of

social esteem was unsatisfactory, we dropped this variable from all analyses. The raw scores obtained on the CCQ-scales can be compared with percentile scores, which are based on a general population sample of children between age 6 and 9 (Van Lier et al., 1992).

Sociometric status. Sociometric data were gathered in individual interviews at school. None of the children knew which child we were focusing on, i.e., the target adopted child. Each child could name three classmates as most liked and three classmates as most disliked. Ambiguous nominations were not allowed. The total number of times a child was rated as liked by his or her classmates formed the raw "like score". The total number of times a child was rated as disliked by classmates formed the raw "dislike score". Subsequently, we computed the "standard preference score", that is, the standardized difference of the standardized like score and the standardized dislike score. We also computed the "standard impact score", that is, the standardized sum of the standardized like score and the standardized dislike score. On the basis of these scores children were assigned to one of five sociometric status categories (Coie & Dodge, 1983; Coie, Dodge, & Coppotelli, 1982). The resulting five status types were: popular, average, neglected, controversial, and rejected.

Intelligence. Intelligence was measured with the abbreviated Revised Amsterdam Child Intelligence Test (RACIT). Bleichrodt, Drenth, Zaal, and Resing (1987) found empirical evidence for convergent validity, as the RACIT correlated $r = .86$ with the Wechsler Intelligence Scale for Children-Revised (WISC-R). At age 7, the abbreviated RACIT correlated $r = .92$ with the full RACIT. The abbreviated RACIT showed a somewhat lower test–retest reliability, namely, $r = .86$ versus $r = .88$, and a somewhat lower internal consistency, namely, $\alpha = .90$ versus $\alpha = .94$, than the full RACIT. The abbreviated RACIT does not seem to underestimate or overestimate the level of individual intelligence.

In the present study, we used the abbreviated RACIT, which consisted of the following subtests: flexibility of closure ($\alpha = .84$), paired associates (split-half reliability = .77), perceptual reasoning (split-half reliability = .73), vocabulary ($\alpha = .74$), inductive reasoning ($\alpha = .86$), ideational fluency ($\alpha = .81$). The reliability of the abbreviated RACIT was .91 ($N = 163$), and was estimated on the basis of the number of subtests, the reliabilities of the subtests, and the correlations between the subtests (Nunally, 1978). The raw scores were transformed to standardized intelligence scores with a mean of 100 (*SD* 15). The standardized scores were derived from a representative sample of 1415 children between age 4 and 11, drawn from the Dutch general school population in 1982 (Bleichrodt et al., 1987).

Maternal sensitive responsiveness. We videotaped two 8-minute episodes of mother–child interaction at home. In the first and second episode the mother was asked to assist her child in solving a puzzle, and to make a drawing together with her child, respectively. Subsequently, global ratings of maternal sensitive-responsive behavior were obtained by means of five 7-point rating scales: Supportive Presence, Hostility, Intrusiveness, Clarity of Instruction, and Sensitivity and Timing (Egeland, Erickson, Clemenhagen-Moon, Hiester, & Korfmacher, 1990; Erickson, Sroufe, & Egeland, 1985), and three 5- to 10-point Emotional Availability Scales (EAS; Biringen & Robinson, 1991; Biringen, Robinson, & Emde, 1993): Hostility, Structuring/Intrusiveness, and Sensitivity[1]. The Egeland/Erickson and EAS were scored by different raters. Intercoder reliability was established on 36% of the tapes ($N = 166$). The averaged Cohen's kappa for agreements within 1 scale point was .87. The scales showed test–retest reliability within a time period of 9 to 12 months after the initial observation, with correlations ranging from $r = .56$ to $r = .84$, $p < .01$, one-tailed ($N = 20$).

Principal components analysis was performed on eight scales. We found a one-dimensional solution. The explained variance was 45%, with factor loadings ranging from .51 to .84. The standardized item alpha was .82. An overall score for maternal sensitive responsiveness was obtained by averaging the scores after standardization. A high score indicates that the mother showed sensitive and responsive behavior towards her child.

Health condition on arrival. In the original studies, when the child was 5 months of age, parents reported about their child's health condition. Health condition on arrival was computed by the standardized summation of three variables: birthweight, incidence of prematurity, and health problems on arrival (reversed). Scores were keyed to a good standard of health. Principal components analysis showed a one-dimensional solution, with factor loadings ranging from .55 to .84, and an explained variance of 54%. The standardized item reliability was .60.

Results

In order to be able to generalize our findings safely, we performed preliminary analyses to examine the effects of sex, country of origin, and family type on the dependent variables in analyses of variance. In the case of multiple comparisons we applied Bonferroni correction, changing the initial level of significance from $p < .05$ to $p < .01$ (three to five comparisons) or to $p < .001$ (six or more comparisons). Age at placement and health condition upon arrival were used as covariates in the analyses.

The results are reported in six sections. In the first section we examine differences between adopted and nonadopted children with respect to the incidence of behavior problems (CBCL and TRF). In the second section adopted children's competencies (TRF) and school behavior (SCHOAL) is studied. In the third section we compare adopted with nonadopted children on personality development (CCQ). In the fourth section we compare adopted and nonadopted children's sociometric status. In the fifth section we focus on adopted children's intelligence (RACIT). In the final section we examine the mother's sensitive responsive behavior (Egeland/Erickson scales and EAS).

Behavior Problems

In most TRF and CBCL scales one to four extreme scoring subjects were found, that is, adopted children scoring more than 3 *SD*s above the mean. Extreme scores were replaced by the highest score within the normal range, thus securing normality of distributions. However, almost all TRF and CBCL scales remained moderately skewed to the right, indicating that children who scored higher had a disproportionate influence on the mean scores of most syndrome scales, as well as the scale for total problems.

Before comparing adopted children with children from the comparison samples, we performed two separate 2 (sex) $\times 3$ (country of origin) $\times 2$ (family type) MANCOVAs on the narrow-band CBCL and TRF syndrome scales. Main effects were adjusted for covariates and preceding effects in the model. Using the Hotellings T criterion, we found significant multivariate effects of sex on the CBCL and TRF narrow-band syndromes: Hotellings $T = .13$, $F(8, 133) = 2.03$, $p < .05$, and Hotellings $T = .21$, $F(8, 115) = 3.07$, $p < .01$,

[1] We decided to omit the EAS for the child, as the child's behavior had not been rated independently from the mother's ratings on the EAS.

Table 1
CBCL, Behavior Problems in Adopted Boys: Comparisons with Boys Drawn from the General and Clinical Population, and Percentages of Boys Exceeding Borderline-Clinical and Clinical Cutoff Scores

	Adopted ($N = 73$)		General ($N = 623$)		Clinical ($N = 944$)		Adopted vs. General		Adopted vs. Clinical		Cutoff	
Behavior problems	Mean	*SD*	Mean	*SD*	Mean	*SD*	*t*	*d*	*t*	*d*	Border %	Clinical %
Withdrawn	2.60	1.97	1.70	1.83	4.89	3.47	3.94*	.49	−5.57*	−.68	10	6
Somatic complaints	1.35	1.49	0.77	1.23	1.81	2.35	3.72*	.46	−1.65	−.20	10	10*[a]
Anxious/Depressed	4.30	3.62	2.46	3.04	7.03	5.45	4.79*	.59	−4.21*	−.51	18*	11*
Social problems	2.34	2.04	1.48	1.96	4.76	3.27	3.53*	.44	−6.23*	−.76	11	11*
Thought problems	0.74	1.17	0.45	0.92	1.62	1.98	2.47	.31	−3.75*	−.46	11	11*
Attention problems	4.91	3.38	3.48	3.06	8.74	4.55	3.74*	.46	−7.04*	−.86	15*	11*
Delinquent behavior	1.99	1.86	1.34	1.47	3.47	3.19	3.47*	.43	−3.91*	−.48	21*	12*
Aggressive behavior	10.44	7.40	7.24	5.65	16.82	9.15	4.42*	.55	−5.81*	−.71	14*	11*
Internalizing	8.08	5.77	4.84	4.72	13.21	8.58	5.41*	.67	−5.02*	−.61	50*	40*
Externalizing	12.10	7.94	8.57	6.65	19.75	11.56	4.20*	.52	−5.55*	−.68	34*	25*
Total problems	33.02[b]	20.03	22.48	15.24	53.20	25.01	5.39*	.67	−6.73*	−.82	47*	33*

[a] Percentages marked as significant indicate higher percentages for adopted boys than for boys from the normative population sample (binomial tests).
[b] This mean equals the cutoff criterion for the borderline clinical range.
* $p < .001$ (one-tailed significance).
After applying Bonferroni correction for 11 comparisons, only effects at $p < .001$ were considered as significant.

respectively. These results indicate that adopted boys displayed significantly more behavior problems than adopted girls. No significant effects of country of origin or family type were found, which indicates that: (1) children adopted from Sri Lanka, Korea, and Colombia did not show different rates of problem behavior; (2) prevalence of behavior problems was not different among adopted children from all-adoptive families and mixed families.

Effects were further explored in a series of separate 2 (sex) × 3 (country of origin) × 2 (family type) ANCOVAs on all CBCL and TRF scales. In the case of the CBCL, boys scored higher than girls on aggressive and externalizing behavior, $F(1, 143) = 11.08, p < .001$, and $F(1, 143) = 10.60, p < .001$, respectively. In the case of the TRF, boys scored higher than girls on externalizing behavior only, $F(1, 122) = 14.74, p < .001$. The variance accounted for ranged between 6.3% (CBCL, aggressive behavior) and 9% (TRF, externalizing behavior). Effects between 1% and 5.9% can be considered as small, effects between 5.9% and 13.8% as medium, and effects above 13.8% as large (Cohen, 1988).

To determine the incidence of behavior problems in adopted children, we compared 7-year-old adopted children with children aged between 4 and 11 years drawn from the *general* and *clinical* population in the Netherlands on all CBCL and TRF scales. The clinical sample consisted of children who attended mental health care services for ambulatory treatment (Verhulst et al., 1996, 1997).

Adopted boys (*CBCL*). A series of *t*-tests revealed that adopted boys scored significantly higher than boys from the general population sample, but significantly lower than boys from the clinical population sample on most CBCL scales (see Table 1). Exceptions were that boys from the adoptive and general population sample did not differ significantly on thought problems, and that boys from the adoptive and clinical population sample did not differ significantly on somatic complaints. The averaged effect size in terms of Cohen's *d* was .51 for comparisons between the adoptive and general population sample, whereas the averaged effect size for comparisons between the adoptive and clinical sample was $d = -.62$. Cohen (1988) defined an effect size of $d = .20$ as small, $d = .50$ as medium, and $d = .80$ as large. A series of binomial tests revealed larger percentages of boys above the deviant cutoff scores in the adoptive sample than in the *normative* population sample on all syndrome scales, except for withdrawn (see Table 1). The normative sample consisted of children from the general population who had not been referred to mental health settings, and did not attend special classes. The percentages of adopted boys above the cutoff scores for the borderline clinical and clinical range on the scale for total problems were 47% and 33%, respectively. Percentages of adopted boys in the clinical range on the scales for internalizing and externalizing behavior were 25% and 40%, respectively.

Adopted boys (*TRF*). A series of separate *t*-tests revealed no significant differences between boys from the adoptive and the general population sample, and significant differences between boys from the adoptive and clinical population sample on all scales but a few exceptions, namely: somatic complaints, thought problems, and delinquent behavior (Table 2). These results indicate that adopted boys did not differ from the general population sample with respect to the incidence of behavior problems, and that they showed fewer behavior problems than boys from the clinical population sample. This was reflected in a weak averaged effect size for comparisons between the adoptive and general population sample of $d = .15$, and a medium averaged effect size for comparisons between the adoptive and clinical population sample of $d = -.57$. Binomial tests revealed significantly larger percentages of adopted boys falling into the clinical range on the scale for anxious/depressed behavior problems, this being 11% (see Table 2).

Adopted girls (*CBCL*). A series of *t*-tests revealed that adopted girls showed significantly more social problems, attention problems, aggressive behavior, externalizing behavior, and total problems than girls from the general population sample, and significantly fewer behavior problems than girls from the clinical population

Table 2
TRF, Behavior Problems in Adopted Boys: Comparisons with Boys Drawn from the General and Clinical Population, and Percentages of Boys Exceeding Borderline-Clinical and Clinical Cutoff Scores

	Adopted ($N = 66$)		General ($N = 519$)		Clinical ($N = 848$)		Adopted vs. General		Adopted vs. Clinical		Cutoff	
Behavior problems	Mean	*SD*	Mean	*SD*	Mean	*SD*	*T*	*d*	*t*	*d*	Border %	Clinical %
Withdrawn	1.88	2.10	2.19	2.69	4.65	3.71	−0.90	−.12	−5.99*	−.77	0	0
Somatic complaints	0.47	0.87	0.36	1.07	0.90	1.78	0.80	.11	−1.94	−.25	6	6
Anxious/Depressed	4.64	5.11	3.50	4.32	7.08	5.89	1.98	.26	−3.27*	−.42	11	11*[a]
Social problems	2.68	2.79	2.40	3.41	5.83	4.64	0.64	.08	−5.44*	−.70	6	3
Thought problems	0.65	1.01	0.51	1.22	1.25	1.85	0.89	.12	−2.60	−.34	8	8
Attention problems	9.15	7.70	7.88	7.49	16.42	9.32	1.29	.17	−6.17*	−.79	8	5
Delinquent behavior	1.29	1.87	0.94	1.78	2.21	2.44	1.50	.20	−2.99	−.38	8	6
Aggressive behavior	8.21	8.82	6.23	8.22	15.13	12.44	1.83	.24	−4.43*	−.57	11	3
Internalizing	6.87	6.77	5.92	6.61	12.21	8.57	1.10	.14	−4.94*	−.63	24	12
Externalizing	9.78	10.38	7.17	9.54	17.34	14.23	2.07	.27	−4.23*	−.54	24	20
Total problems	28.24	22.80	23.38	22.72	51.69	28.85	1.64	.21	−6.45*	−.83	27	20

[a] Percentages marked as significant indicate higher percentages for adopted boys than for boys from the normative population sample (binomial tests).

* $p < .001$ (one-tailed significance).

After applying Bonferroni correction for 11 comparisons, only effects at $p < .001$ were considered as significant.

Table 3
CBCL, Behavior Problems in Adopted Girls: Comparisons with Girls Drawn from the General and Clinical Population, and Percentages of Girls Exceeding Borderline-Clinical and Clinical Cutoff Scores

	Adopted ($N = 86$)		General ($N = 618$)		Clinical ($N = 478$)		Adopted vs. General		Adopted vs. Clinical		Cutoff	
Behavior problems	Mean	*SD*	Mean	*SD*	Mean	*SD*	*T*	*d*	*t*	*d*	Border %	Clinical %
Withdrawn	1.97	1.72	1.86	2.08	5.09	3.56	0.47	.05	−7.96*	−.95	6	2
Somatic complaints	1.39	1.69	1.04	1.69	2.46	2.75	1.80	.21	−3.49*	−.41	12	6
Anxious/Depressed	3.02	2.86	2.62	3.20	7.33	5.71	1.10	.13	−6.84*	−.82	7	3
Social problems	2.06	2.11	1.27	1.79	4.21	3.14	3.75*	.43	−6.10*	−.72	14*	14*[a]
Thought problems	0.64	1.02	0.50	1.13	1.58	2.00	1.09	.13	−4.26*	−.51	9	9*
Attention problems	4.30	3.67	2.57	2.85	7.23	4.64	5.08*	.59	−5.55*	−.65	19*	13*
Delinquent behavior	1.41	1.39	0.96	1.56	2.52	2.56	2.54	.29	−3.92*	−.47	9	9*
Aggressive behavior	7.17	4.95	5.29	4.82	12.45	8.53	3.38*	.39	−5.57*	−.66	15*	5
Internalizing	6.25	4.83	5.41	5.52	14.31	9.30	1.34	.15	−7.84*	−.94	28	19
Externalizing	8.57	5.94	6.24	5.85	14.97	10.47	3.45*	.40	−5.51*	−.65	34*	21*
Total problems	26.80	16.66	19.97	16.14	48.15	24.83	3.66*	.42	−7.67*	−.91	35*	30*

[a] Percentages marked as significant indicate higher percentages for adopted girls than for girls from the normative population sample (binomial tests).

* $p < .001$ (one-tailed significance).

After applying Bonferroni correction for 11 comparisons, only effects at $p < .001$ were considered as significant.

sample (see Table 3). The averaged effect sizes for comparisons between the adoptive and general population sample, and the adoptive and clinical population sample were $d = .29$ and $d = -.70$, respectively. Significant percentages of adopted girls scoring in the deviant ranges were found on social problems, thought problems, attention problems, delinquent behavior, aggressive behavior, externalizing behavior, and total problems. The percentages of adopted girls exceeding the cutoff scores for the borderline clinical and clinical range on the scale for total problems were 35% and 30%, respectively. The percentage of adopted girls falling into the clinical range for externalizing behavior was 21%.

Adopted girls (*TRF*). A series of *t*-tests and binomial tests revealed that adopted girls did not differ significantly from girls in the general and normative population samples with respect to the incidence of behavior problems (see Table 4). Also, adopted girls scored lower on all syndromes and total problems than girls from the clinical population sample. The averaged effect size for comparisons between the adoptive and clinical sample was $d = -.59$.

To summarize, mother reports indicated that adopted boys experienced serious behavior problems at home. Large percentages of adopted boys were classified as clinical on total problems, namely 33%, internalizing behavior, 40%, and externalizing behavior, 25%. Also, mother reports indicated that adopted girls showed a higher incidence of behavior problems, but percentages were somewhat smaller. However, 30% of the adopted girls still exceeded the cutoff criterion for the clinical range on total problems. Teacher reports indicated that adopted children were no more likely than children from the general and normative population to have behavior problems at school, though the TRF showed the same direction of effects as the CBCL. Both mother and teacher reports indicated that adopted boys displayed more behavior problems than adopted girls.

Table 4
TRF, Behavior Problems in Adopted Girls: Comparisons with Girls Drawn from the General and Clinical Population, and Percentages of Girls Exceeding Borderline-Clinical and Clinical Cutoff Scores

	Adopted ($N = 72$)		General ($N = 498$)		Clinical ($N = 417$)		Adopted vs. General		Adopted vs. Clinical		Cutoff	
Behavior problems	Mean	*SD*	Mean	*SD*	Mean	*SD*	*T*	*d*	*t*	*d*	Border %	Clinical %
Withdrawn	2.05	2.21	1.93	2.60	4.51	3.88	0.37	.05	−5.23*	−.68	4	1
Somatic complaints	0.81	1.51	0.48	1.13	1.29	2.19	2.21	.28	−1.79	−.23	7	6
Anxious/Depressed	3.92	4.38	3.23	4.27	6.59	5.84	1.28	.16	−3.70*	−.47	7	6
Social problems	1.71	2.10	1.87	3.01	5.13	4.84	−0.43	−.06	−5.90*	−.77	4	1
Thought problems	0.33	0.65	0.37	0.94	1.06	1.59	−0.35	−.04	−3.84*	−.50	1	1
Attention problems	5.35	5.72	4.93	6.07	11.34	9.16	0.55	.07	−5.37*	−.69	7	7
Delinquent behavior	0.61	0.93	0.58	1.10	1.42	2.04	0.22	.03	−3.31*	−.43	6	6
Aggressive behavior	2.95	4.42	2.88	4.89	8.74	10.39	0.11	.01	−4.65*	−.61	6	4
Internalizing	6.49	5.88	5.52	6.48	11.93	9.04	1.20	.15	−4.93*	−.63	23	18
Externalizing	3.42	4.14	3.47	5.56	10.16	11.85	−0.07	−.01	−4.77*	−.63	18	12
Total problems	17.34	14.16	15.74	17.07	38.15	27.11	0.76	.10	−6.36*	−.83	24	12

* $p < .001$ (one-tailed significance).
After applying Bonferroni correction for 11 comparisons, only effects at $p < .001$ were considered as significant.

Competencies and School Behavior

In preliminary analyses, we conducted a 2 (sex) × 3 (country of origin) × 2 (family type) MANCOVA on academic performance, and adaptive functioning at school (TRF). Using the sequential method we found no significant effects of sex, country of origin, and family type. Separate *t*-tests and binomial tests revealed no differences in academic performance and adaptive functioning at school between adopted children and children from the general and normative population samples. Also, adopted children performed significantly better at school than children from the clinical population sample. The large averaged effect sizes for comparisons between the adoptive and clinical population sample were $d = 1.33$ for boys, and $d = 1.06$ for girls. A small percentage of adopted children (3%) attended schools for special education, and 20% of the adopted children had repeated grades. In the normative populations sample, a significantly smaller percentage of children, that is, between 5 and 10%, had repeated grades by the age of 7.

A 2 (sex) × 3 (country of origin) × 2 (family type) MANCOVA on attitude to work, agreeableness, emotional stability, and extroversion (SCHOAL), revealed no significant effects of sex, country of origin, and family type. We examined differences between adopted children and children from the standardization sample by comparing the mean raw and standardized SCHOAL scores in separate *t*-tests. Differences were examined on the basis of the total adoptive sample, as well as boys and girls separately, but no significant differences were found. Moreover, most effect sizes were extremely small, that is, far below $d = .20$.

Personality Development

First we examined the effects of sex, country of origin, and family type on personality development in the adoptive sample. Two separate 2 (sex) × 3 (country of origin) × 2 (family type) MANCOVAs were performed on all CCQ scales. Main effects were adjusted for preceding effects in the model. The analysis of the CCQ data (teacher report) revealed a significant multivariate main effect of sex on personality development, Hotellings $T = .27$, $F(10, 111) = 3.03$, $p < .01$. No significant effects of the child's country of origin, and family type were found. Univariate *F*-tests showed that only vitality contributed significantly to the overall difference, $F(1, 120) = 14.51$, $p < .001$, which indicated that teachers rated boys higher on vitality than girls, mean = 33.3 ($SD = 7.0$), and mean = 28.2 ($SD = 7.3$), respectively. The explained variance was 11%. The univariate effects of sex on ego-undercontrol and prosocial competence were significant at $p < .05$, and indicated that adopted girls were less undercontrolled and showed higher levels of prosocial competence in comparison with adopted boys. However, the effects were no longer significant after applying a Bonferroni correction for 10 comparisons.

We determined differences between adopted children and children from the general population sample by conducting a series of separate *t*-tests on all CCQ scales, both mother and teacher report. On the basis of mother reports, no significant differences were found between children from the adoptive and general population sample. Teacher reports, however, revealed significant differences, but only for girls (see Table 5). Unexpectedly, adopted girls compared favorably with girls from the general population sample on ego-undercontrol and prosocial competence. Adopted girls scored significantly lower on ego-undercontrol and significantly higher on prosocial competence than girls from the general population sample. The medium effect sizes were $d = -.60$ and $d = .60$, respectively. The mean score for ego-undercontrol (33.9) equaled the 35th percentile for girls from the general population sample, while the mean score for prosocial competence (82.7) equaled the 65th percentile.

Peer Group Popularity (*Sociometric Status*)

In preliminary analyses, we examined the relations between sociometric status, sex, country of origin, family type, age at placement, and health condition on arrival in a six-way hierarchical loglinear frequency analysis. For the purpose of this analysis, continuous variables were dichotomized. Backward elimination of effects produced a model with a good fit, $\chi^2(212, 132) = 94.37$, $p = 1.0$, that included five two-way associations: country of origin by sex, family type, age at placement, and sociometric status, and sex by sociometric status. After performing

Table 5
CCQ Teacher Q-sort, Personality Development in Adopted Girls: Comparison with Girls between Age 6 and 9 Drawn from the General School Population (Means, and Effect Sizes)

	Adopted ($N = 72$)		Non-adopted ($N = 121$)			
Personality development	Mean	*SD*	Mean	*SD*	*t*	*d*
Ego-resiliency	54.5	11.5	54.2	12.1	0.17	.03
Ego-brittleness	28.6	9.3	28.3	11.0	−0.20	.03
Creativity	24.6	6.3	22.9	6.1	1.81	.27
Ego-overcontrol	35.6	9.7	33.5	10.3	1.42	.21
Ego-undercontrol	33.9	9.1	40.2	11.5	−3.99*	−.60
Prosocial competence	82.7	13.7	72.4	19.0	4.01*	.60
Antisocial competence	36.0	14.0	43.3	17.3	−3.04	−.45
Depression	31.5	9.8	31.6	11.7	−0.05	−.01
Self-esteem	53.5	8.7	51.4	10.6	1.44	.22
Vitality	28.2	7.3	28.9	8.8	−0.55	−.08

* $p < .001$ (two-tailed significance).
After applying Bonferroni correction for 10 comparisons, only effects at $p < .001$ were considered as significant.

Table 6
Sociometric Status in Adopted Children: Percentages Popular, Average, Neglected, Controversial, and Rejected Children

	Adopted[a] group ($N = 132$)	Adopted[b] girls ($N = 71$)	Adopted boys ($N = 61$)	Comparison group 1 ($N = 3744$)	Comparison group 2 ($N = 4177$)
Popular	26%	30%	21%	13%	13%
Average	52%	57%	49%	54%	59%
Neglected	10%	11%	10%	15%	8%
Controversial	7%	1%	13%	6%	6%
Rejected	5%	1%	7%	12%	13%

[a] The adopted group differed significantly from the first and second comparison group: $\chi^2(4, 132) = 25.81$, $p < .001$, and $\chi^2(4, 132) = 26.92$, $p < .001$, respectively.
[b] Adopted girls differed significantly from the first and second comparison group: $\chi^2(4, 71) = 24.87$, $p < .001$, and $\chi^2(4, 71) = 25.61$, $p < .001$, respectively.

separate post hoc chi-square analyses on the two associations that were of interest to us, namely, those including sociometric status, only sex proved to be significantly related to sociometric status: $\chi^2(4, 132) = 10.14$, $p < .05$. The association indicated that adopted girls were rated as more popular than adopted boys.

Table 6 presents percentages of adopted children classified as popular, average, neglected, controversial, and rejected on the basis of the standard score model. Comparisons were made with a group of 3744 school-aged children (the classmates who provided sociometric data for the purpose of the current study), and a group of 4177 school-aged children from a heterogeneous pooled general population sample (Cillessen & Ten Brink, 1991). A series of separate one-sample chi-square tests were performed to assess the degree of correspondence between the adoptive sample and the comparison samples. We found significant differences between the adoptive sample and both comparison samples, but separate analyses for boys and girls revealed that adopted girls were responsible for the effect: $\chi^2(4, 71) = 24.87$, $p < .001$ for the comparison with classmates; $\chi^2(4, 71) = 25.61$, $p < .001$ for the comparison with the general school population. From Table 6 it can be surmised that popular girls were overrepresented in the adoptive sample, whereas rejected girls were underrepresented, which indicates that adopted girls' peer group popularity was relatively high. A large percentage of adopted girls, 30%, was rated as popular by their classmates, which compares favorably to the 13% found in two general population samples.

Intelligence

In preliminary analyses, we performed a 2 (sex) × 3 (country of origin) × 2 (family type) ANCOVA on mean standardized intelligence scores (RACIT) in the adoptive sample. After hierarchical assessment of covariates and main effects, we found a significant main effect of sex, $F(1, 131) = 9.19$, $p < .01$, which indicated that boys were more intelligent than girls. The observed means were 111 ($SD = 14$) and 105 ($SD = 14$), respectively. The child's age at placement and health condition on arrival proved to be significant as covariates: $F(1, 131) = 13.89$, $p < .001$; $F(1, 131) = 4.67$, $p < .05$, respectively. Health condition on arrival correlated $r = .19$, $p < .05$ with intelligence, indicating that a better standard of health measured at the age of 5 months was associated with higher intelligence scores in middle childhood. The correlation remained significant after adjusting for sex, country of origin, and age at placement. Unexpectedly, the child's age at placement showed a positive zero-order correlation with intelligence, $r = .28$, $p < .001$, which

Table 7
Intelligence in Adopted Children: Means, SDs *and Classifications*

	Intelligence									
	Scores[a]					Classifications[b]				
Groups	Mean	*SD*	*N*	95% CI	Range	Slow learner %	Low average %	Average %	Bright average %	Superior %
Total group	107*	14	147	105–110	77–145	3	5	56	20	16
Sex of the child										
Boys	111*	14	68	108–114	78–145	1	3	52	22	22
Girls	105	14	79	102–108	77–139	5	6	60	19	10
Country of origin										
Sri Lanka	104	13	100	102–107	77–139	5	7	60	18	10
Colombia	112	12	11	104–120	93–130	0	0	46	36	18
Korea	115*	15	36	110–120	92–145	0	0	47	22	31
Health condition										
< 25%	105	14	37	100–110	77–137	8	6	51	19	16
50%	106*	14	77	103–109	78–145	3	5	62	18	12
> 25%	113*	13	31	109–118	92–144	0	0	48	29	23
Age at placement										
< 25%	101	13	37	97–105	77–129	11	3	65	16	5
50%	108*	13	77	105–111	78–139	1	8	55	19	17
> 25%	114*	14	33	109–119	93–145	0	0	49	27	24

[a] The comparison group consisted of 7-year-old children and was drawn from the general school population, Mean = 100, SD = 15, N = 252.
[b] Classifications: 70–79 slow learner, 80–89 low-average, 90–110 average, 111–120 bright average, > 120 superior (Sattler, 1982).
* $p < .001$.

Table 8
Maternal Sensitive Responsiveness: Comparison between Mothers in Adoptive Families and Natural Families

	Adoptive families (N = 151)		Natural families (N = 30)			
Maternal sensitive responsiveness	Mean	*SD*	Mean	*SD*	*t*	*d*
Egeland/Erickson scales	19.01	6.08	22.87	6.90	−3.08	−.61
Emotional support	2.53	1.62	4.10	2.00	−4.67*	−.88
Sensitivity and timing	2.72	1.75	4.12	1.87	−3.95*	−.76
Intrusiveness	3.83	2.07	3.82	1.91	0.04	.00
Clarity of instruction	2.87	1.61	3.48	1.63	−1.90	−.37
Hostility	1.27	0.53	1.05	0.20	2.21	.44
Emotional availability scales	14.37	2.60	15.53	1.84	−2.34	−.46
Sensitivity	5.44	1.61	6.17	1.29	−2.34	−.46
Structuring	4.14	0.83	4.47	0.66	−2.04	−.41
Hostility	1.21	0.53	1.10	0.24	1.09	.22
Sensitive responsiveness (total score)	−0.09	0.65	0.36	0.61	−3.46*	−.68

* $p < .001$ (two-tailed significance).
After applying Bonferroni correction for 11 comparisons, only effects at $p < .001$ were considered as significant.

indicated that an older age at placement was related to higher intelligence scores in middle childhood. As age at placement was strongly associated with country of origin—Sri Lanka mean = 7 weeks, Korea and Colombia mean = 15 weeks, $F(2, 156) = 96.75$, $p < .001$—we computed the correlation between age at placement and intelligence, after controlling for country of origin. This partial correlation was no longer significant, $r = .08$, $p = .35$. Moreover, one-way ANOVA showed an effect of country of origin on intelligence, $F(2, 144) = 8.27$, $p < .001$, with significantly higher intelligence scores for Korean children than for children from Sri Lanka, $p < .05$. Table 7 shows that the mean intelligence score for Korean children was 115 (SD = 15), whereas the mean intelligence score for children from Sri Lanka was 104 (SD = 13). The mean intelligence score for the small group of Colombian children was 112 (SD = 12).

Table 7 presents the mean intelligence scores for the adoptive sample, including the 95% confidence interval for the mean, the range, and the percentages of children classified in one of the following categories: slow learner, low average, average, bright average, and superior (Sattler, 1982). In a series of one-sample t-tests, it was shown that the total adoptive group, boys, Korean children, and children above the 25th percentile of health condition on arrival and age at placement had sig-

nificantly higher intelligence scores than the general population mean of 100. Korean children had the highest scores (mean = 115, $SD = 15$): 31% of these children were classified as superior, that is, obtaining an intelligence score above 120.

Maternal Sensitive Responsiveness

A preliminary 2 (sex) × 3 (country of origin) × 2 (family type) ANCOVA on maternal sensitivity did not yield significant effects. However, health condition on arrival proved to be significant as a covariate, $F(1, 135) = 7.29$, $p < .01$. Health condition correlated $r = -.21$, $p < .05$ with maternal sensitive responsiveness, which indicated that a lower standard of health on arrival was associated with higher levels of maternal sensitive responsiveness in middle childhood. The correlation remained significant with the influences of sex, age at placement, and country of origin partialled out, $r = -.22$, $p < .01$.

We compared 151 adoptive mothers to 30 nonadoptive mothers, that is, mothers with biological children, on maternal sensitive responsiveness. A 2 (boys vs. girls) × 2 (adoptive vs. nonadoptive mothers) ANCOVA on maternal sensitive responsiveness, with age of the mother entered as a covariate, revealed a main effect of family type, $F(1, 176) = 8.60$, $p < .01$, which indicated that nonadoptive mothers were more sensitive and responsive than adoptive mothers (see Table 8). The medium effect size was $d = -.68$. To determine which scales contributed to the overall difference, we performed a series of separate *t*-tests on all scales. Table 8 shows that the Egeland/Erickson scales Supportive Presence and Sensitivity and Timing contributed significantly to the overall effect. The effect sizes ranged from small ($d = .22$) to large ($d = -.88$), while all effects pointed into the same direction, that is, to lower levels of sensitive responsiveness in adoptive families.

Discussion

The primary objective of the present study was to examine the adjustment of infant-placed 7-year-old internationally adopted children in comparison to nonadopted children in several domains of child development. As expected, results from the present study provide evidence that adopted children show elevated rates of parent-reported problem behavior at home. However, the adopted children showed favorable adjustment at school. Academic performance was in the normal range, and the children showed above-average intelligence.

Several studies have shown that from the onset of middle childhood adopted children, in particular boys, appear to be at increased risk for behavior problems, most apparently in the domain of externalizing behavior problems (e.g. Andresen, 1992; Brodzinsky, Radice, Huffman, & Merkler, 1987; Brodzinsky, Schechter, Braff, & Singer, 1984). In adolescence, this seems even more the case (Fergusson, Lynskey, & Horwood, 1995). In the Netherlands, a large epidemiological study was conducted in a nonclinical community-based sample to examine the behavioral adjustment of internationally adopted children (Verhulst et al., 1990). Between the ages of 10 and 12 years, no differences between adopted and nonadopted children were found. Between the ages of 13 and 15 years, however, adopted boys showed more behavior problems than nonadopted boys. In late adolescence, between the ages of 15 and 18 years, both adopted boys and girls showed more behavior problems than nonadopted children (Versluis-den Bieman & Verhulst, 1995).

In the present study, maternal ratings of behavior problems were higher for adopted children than for nonadopted children, and they were somewhat higher for adopted boys than for adopted girls. Rather large percentages of adopted boys were classified as clinical on total problems, namely 33%, internalizing behavior, 40%, and externalizing behavior, 25%. In the normative population, these percentages do not exceed 10%. For adopted boys, teacher ratings were in the same direction, but differences failed to reach significance except for anxious/depressed behavior problems: 11% of the adopted boys exceeded the cutoff criterion for the clinical range, while 2% can be considered as normative. On the basis of mother reports 30% of the adopted girls were classified as clinical on total problems, 19% on internalizing behavior, and 21% on externalizing behavior.

The present results are in line with those from other adoption studies in middle childhood, except for the high incidence of internalizing behavior in adopted boys. Fergusson et al. (1995) hypothesized that relatively high levels of internalizing behavior in adopted children may reflect a negative influence of adoption-related variables, as e.g. uncertainties about one's origin was expected to result in mood disorder, anxiety disorders, and lowered self-esteem. Empirical evidence for this interpretation can be found in Ripple's follow-up study of infant-placed adopted children (1968). Ripple found that relatively many of the 7- to 10-year-old adopted children had emotional and behavioral problems, but these were more in the domain of internalizing than externalizing problems.

Notably, the high incidence of behavior problems found at home in our study appeared not to pervade into the school setting, though both teachers and mothers rated adopted boys as relatively anxious/depressed, and effects sizes were generally in the same direction. The discrepant findings could result from rater bias, that is, mothers having a lower threshold for perceiving or reporting behavior problems in their children than teachers (Spiker, Kraemer, Constantine, & Bryant, 1992). Such an explanation, however, seems less obvious, as several adoption studies showed that findings across mother, teacher, and self-report ratings were consistent (e.g. Brodzinsky et al., 1984, 1987; Versluis-den Bieman & Verhulst, 1995). Moreover, there is some empirical evidence that teachers tend to underestimate behavior problems in specific samples, such as children with special needs, so as to compensate for a deficit (Scheepstra, 1998).

It is also possible that discrepant findings represent salient differences in the child's reaction to the home and school situation. In this case, the incidence of behavior problems at home could reflect more problematic family relationships, and a lower quality of mother–child interaction. In our study we found some support for this explanation, since adoptive mothers showed less sensitive responsiveness towards their children than nonadoptive mothers, whereas in another study of the present sample maternal sensitive responsiveness was shown to be associated with the child's adjustment (Stams, Juffer, & Van IJzendoorn, 1998).

In the Introduction, we hypothesized that adoption-related factors could exert a negative influence on the

adjustment of adoptees. Prompted by Haugaard (1998, p. 67), we contend that differences in mean scores between the adoptive and comparison sample, if distributions are normal in form, can inform us about the degree to which "most or all" adopted children's adjustment is influenced negatively. In the present study, adopted boys had higher CBCL problem scores than children from the general population, whereas adopted girls scored higher on several scales, and on total problems. The averaged effect size for comparisons between the adoptive and general population sample was $d = .51$ for boys (medium), and $d = .29$ for girls (small). Indeed, as most distributions were only moderately skewed and the assumption of normality was never violated, results indicated that the sample as a whole may have been influenced by adoption-related factors. Interestingly, the present study focused on children adopted in infancy without histories of severe deprivation. An overrepresentation of adopted children in the clinical range may, however, be explained by cumulative risk factors, including genetic influences (Fergusson et al., 1995; Schmitz, Fulker, & Mrazek, 1995; Van den Oord, Boomsma, & Verhulst, 1994), or risks during pregnancy and delivery. In contrast, optimal adjustment may be explained by cumulative protective factors, or adequate coping strategies (Smith & Brodzinsky, 1994).

Though adopted children are generally overrepresented in special education classes and show lowered general school adjustment (Brodzinsky & Steiger, 1991; Verhulst et al., 1990; Wierzbicki, 1993), some of our discrepant findings may be explained by differences in the age at placement (Tizard, 1991). In a Dutch study by Hoksbergen, Juffer, and Waardenburg (1987), a group of mostly infant-placed 9-year-old internationally adopted children were shown to have favorable school adjustment. In the present study, we found no differences in academic performance, adaptive functioning, and socioemotional behavior at school between adopted children and non-adopted children. The intelligence of adopted children was above average, and 31% of the Korean children were classified as superior. This finding is in agreement with studies by Frydman and Lynn (1989), who also found relatively high IQ scores for children adopted from Korea, and Kim (1995) and Andresen (1992), who reported favorable adjustment for Korean adoptees. The adoptive children's above-average intelligence and favorable school adjustment in the present study suggest that adoptive parents offer their children sufficient or even more than average cognitive stimulation and encouragement. Here, adoption can be considered as a protective factor (see also Colombo, de la Parra, & Lopez, 1992).

Finally, adopted girls compared favorably with non-adopted children with respect to social competence, ego-control, and peer group popularity. A rather large percentage of adopted girls, i.e. 30%, were rated as popular by their classmates, which is about twice that of their peers. Higher levels of prosocial behavior were also reported in a large study of the adjustment of adolescent adoptees in the United States (Sharma et al., 1996). Sharma et al. speculated that adopted children, who have already experienced loss, may try to avoid future abandonment by strengthening their social abilities. In our view adoptive parents may also be relatively social themselves, and subsequently pass on prosocial values to their children. Also, from anecdotal parent reports we hypothesize that it may be a more or less explicit strategy to teach adopted children prosocial values, in order to make them less vulnerable to (racial) discrimination. For similar reasons adoptive parents may encourage academic performance, and stimulate general cognitive abilities in their children. In the present sample 38 adoptive children (24%) encountered negative (racial) discrimination, and 14 children (9%) encountered positive discrimination, according to their parents.

In the present study, adoptive mothers showed lower levels of sensitive responsiveness in middle childhood than nonadoptive mothers. In an earlier study of the present sample at age 6 and 12 months (Juffer & Rosenboom, 1997), no differences in sensitive responsiveness were found between adoptive mothers and nonadoptive mothers. The results therefore suggest that the mothers' sensitive responsiveness decreased between early infancy and middle childhood. Only speculations can be offered to explain such a decline. One explanation may be found in a(n) (increasing) lack of "goodness of fit". This lack of fit could reside in genetically influenced child dispositions, such as temperament or personality characteristics, that may hamper an adoptive mother's identification and communication with her child (Ge et al., 1996).

An important limitation of the present study concerns the absence of information about the pre-adoption care of the children, and about the children's genetic background. It would, of course, be of special interest to examine associations between these pre-adoption variables and later problem behavior and/or later favorable school behavior. Another limitation of the study concerns the small number of nonadoptive mothers in the comparison group of biological families ($N = 30$), and the fact that this group had not been followed longitudinally. So, results regarding differences in maternal sensitive responsiveness between adoptive and biological families do not permit strong conclusions, and should be interpreted with care.

The same line of reasoning holds for conclusions with respect to adopted children's adjustment that are based on comparisons with general population samples. It could be considered as a study limitation that the adopted children were not compared to a comparison group studied at the same time, e.g. a classmate of each adopted child. In our design we did not have the opportunity to study such a group. Therefore, test procedures may have been different in our sample than in the original general population samples, implying that the found differences may also partly reflect testing and cohort effects.

Also, one could argue that general population samples should not be regarded as "equivalent" quasi-experimental control groups for an adoptive sample. In the earlier cited Colombo et al. study (1992), and in a number of other studies using more or less equivalent control groups (e.g. Tizard & Hodges, 1978), adopted children compared favorably to children who were restored to their biological parents or placed in an institution. Nevertheless, adopted children showed consistently lower levels of adjustment than age-matched children from the general population. In Fergusson et al.'s (1995) longitudinal study of a birth cohort of 1265 children, it was found that adopted children were advantaged with respect to supportive parenting, educational opportunities, and family stability. At age 16, the adoptees compared favorably with children from single-parent families, but at the same time were at greater risk for psychopathology than children in two-parent families.

In summary, the present study provides evidence of an elevated risk of behavior problems for adopted children in middle childhood. This risk appeared to be greater for boys than girls, and was only apparent in the home setting. The large percentage of adopted children in the clinical range may be ascribed to multiple risk factors, unknown genetic and pre-adoption variables, and in adoption-related factors, such as an increasing understanding of adoption in middle childhood. Contrary to the home setting, adopted children, and in particular girls, showed favorable socioemotional adjustment at school, while academic achievement and intelligence were in the normal range or above average. These results may indicate that adoptive families are resourceful in stimulating their children.

Since several adoption studies suggest that adoptees show an increased rate of behavior problems in adolescence (e.g. DeBerry, Scarr, & Weinberg, 1996; Sharma et al., 1996; Verhulst et al., 1990), adopted children's behavior problems at home in middle childhood may not be transitory. Thus, it seems imperative that adoptive families be supported so that their available educational resources, which are thought to be great (Fergusson et al., 1995; this study), can be utilized.

Acknowledgements—We are grateful for the assistance of Professor Dr M. H. van IJzendoorn, E. Rigg-Jansen, H. K. Andriesse, M. P. de Graaf, C. M. de Haas, J. W. A. L. Heijmans, E. Hoogmoed, N. Jenner, E. Kornelis, S. Niemeijer, I. Nijhof, J. Rovers, J. S. van Dijk, M. van Vliet, M. H. C. Verkerk, R. Visser, and M. Zwaanswijk. This study was supported by the Netherlands Organization for Scientific Research (NWO, grant no. 575-87-701 to Professor Dr R. A. C. Hoksbergen and Dr F. Juffer).

References

Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/ 14-18 and 1991 profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.

Achenbach, T. M. (1991b). *Manual for the Teacher's Report Form and 1991 profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.

Andresen, I. L. K. (1992). Behavioral and school adjustment of 12–13-year-old internationally adopted children in Norway: A research note. *Journal of Child Psychology and Psychiatry*, *33*, 427–439.

Berry, M. (1992). Contributors to adjustment problems of adoptees: A review of the longitudinal research. *Child and Adolescent Social Work Journal*, *9*, 525–540.

Biringen, Z., & Robinson, J. (1991). Emotional availability in mother–child interactions: A reconceptualization for research. *American Journal of Orthopsychiatry*, *61*, 258–271.

Biringen, Z., Robinson, J. L., & Emde, R. N. (1993). *Manual for scoring of the Emotional Availability Scales middle childhood version*. Boulder, CO: University of Colorado.

Bleichrodt, N., Drenth, P. J. D., Zaal, J. N., & Resing, W. C. M. (1987). *RAKIT-handleiding: Revisie Amsterdamse Kinder Intelligentie Test*. (Revised Amsterdam Child Intelligence Test.) Lisse, The Netherlands: Swets & Zeitlinger.

Bleichrodt, N., Resing, W. C. M., & Zaal, J. N. (1993). *Beoordeling van schoolgedrag: SCHOBL-R*. (Evaluation of school behavior: SCHOBL-R.) Lisse, The Netherlands: Swets & Zeitlinger.

Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Minnesota symposium on child psychology* (pp. 39–101). Hillsdale, NJ: Lawrence Erlbaum.

Brodzinsky, D. M. (1987). Adjustment to adoption: A psychosocial perspective. *Clinical Psychology Review*, *7*, 25–47.

Brodzinsky, D. M., Radice, C., Huffman, L., & Merkler, K. (1987). Prevalence of clinically significant symptomatology in a nonclinical sample of adopted and nonadopted children. *Journal of Clinical Child Psychology*, *16*, 350–356.

Brodzinsky, D. M., Schechter, D. E., Braff, A. M., & Singer, L. M. (1984). Psychological and academic adjustment in adopted children. *Journal of Consulting and Clinical Psychology*, *52*, 582–590.

Brodzinsky, D. M., Singer, L. M., & Braff, A. M. (1984). Children's understanding of adoption. *Child Development*, *55*, 869–878.

Brodzinsky, D. M., & Steiger, C. (1991). Prevalence of adoptees among special education populations. *Journal of Learning Disabilities*, *24*, 484–489.

Cillessen, A. H. N., & Ten Brink, P. W. M. (1991). Vaststelling van relaties met leeftijdgenoten. (Assessment of children's peer relationships.) *Pedagogische Studiën*, *68*, 1–14.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.

Coie, J. D., & Dodge, K. A. (1983). Continuities and changes in children's social status: A five-year longitudinal study. *Merrill-Palmer Quarterly*, *29*, 262–282.

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, *18*, 557–570.

Colombo, M., de la Parra, A., & Lopez, I. (1992). Intellectual and physical outcome of children undernourished in early life is influenced by later environmental conditions. *Developmental Medicine and Child Neurology*, *34*, 611–622.

DeBerry, K. M., Scarr, S., & Weinberg, R. (1996). Family racial socialization and ecological competence: Longitudinal assessments of African-American transracial adoptees. *Child Development*, *67*, 2375–2399.

Egeland, B. R., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. Special Issue: Milestones in the development of resilience. *Development and Psychopathology*, *5*, 517–528.

Egeland, B., Erickson, M. F., Clemenhagen-Moon, J., Hiester, M. K., & Korfmacher, J. (1990). *24 months tools coding manual: Project steep-revised 1990 from mother-child project scales*.

Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985). The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. In I. Bretherton & E. Waters (Eds.), *Growing points of attachment: Theory and research. Monographs of the Society for Research in Child Development*, *50*, 147–166. Chicago: The University of Chicago Press.

Fergusson, D. M., Lynskey, M., & Horwood, L. J. (1995). The adolescent outcomes of adoption: A 16-year longitudinal study. *Journal of Child Psychology and Psychiatry*, *36*, 597–615.

Festinger, T. (1990). Adoption disruption: Rates and correlates. In D. M. Brodzinsky & M. D. Schechter (Eds.), *The psychology of adoption* (pp. 201–218). New York: Oxford University Press.

Frydman, M., & Lynn, R. (1989). The intelligence of Korean children adopted in Belgium. *Personality and Individual Differences*, *10*, 1323–1325.

Ge, X., Conger, R. D., Cadoret, R. J., Neiderhiser, J. M., Yates, W., Troughton, E., & Stewart, M. A. (1996). The developmental interface between nature and nurture: A mutual influence model of child antisocial behavior and parent behaviors. *Developmental Psychology*, *32*, 574–589.

Geerars, H., Hoksbergen, R. A. C., & Rooda, J. (1995). *Geadopteerden op weg naar volwassenheid. De integratie van 68 Thaise jongeren in de Nederlandse samenleving*. (Adoptees on their way to adulthood. The integration of 68 adoptees from Thailand in the Dutch society.) Utrecht, The Netherlands: Utrecht University, Center for Adoption Studies.

Haugaard, J. J. (1998). Is adoption a risk factor for the development of adjustment problems? *Clinical Psychology Review*, *18*, 47–69.

Hoksbergen, R. A. C. (1997). Turmoil for adoptees during their

adolescence? *International Journal of Behavioral Development*, *20*, 33–46.

Hoksbergen, R. A. C., Juffer, F., & Waardenburg, B. C. (1987). *Adopted children at home and at school*. Lisse, The Netherlands: Swets & Zeitlinger.

Juffer, F. (1993). *Verbonden door adoptie. Een experimenteel onderzoek naar hechring en competentie in gezinnen met een adoptiebaby*. (Attached through adoption. An experimental study on attachment and competence in families with an adopted baby.) Amersfoort, The Netherlands: Academische Uitgeverij.

Juffer, F., Hoksbergen, R. A. C., Riksen-Walraven, J. M. A., & Kohnstamm, G. A. (1997). Early intervention in adoptive families—supporting maternal sensitive responsiveness, infant–mother attachment, and infant competence. *Journal of Child Psychology and Psychiatry*, *38*, 1039–1050.

Juffer, F., & Rosenboom, L. G. (1997). Infant–mother attachment of internationally adopted children in the Netherlands. *International Journal of Behavioral Development*, *20*, 93–107.

Kim, W. J. (1995). International adoption: A case review of Korean children. *Child Psychiatry and Human Development*, *25*, 141–154.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

O'Connor, T. G., Bredenkamp, D., Rutter, M., & the English and Romanian Adoptees Study Team (1999). Attachment disturbances and disorders in children exposed to early severe deprivation. *Infant Mental Health Journal*, *20*, 10–29.

O'Connor, T. G., Rutter, M., Beckett, C., Keaveney, L., Kreppner, J., & the English and Romanian Adoptees Study team (2000). The effects of global severe privation on cognitive competence: Extension and longitudinal follow-up. *Child Development*, *71*, 376–390.

Ripple, L. (1968). A follow-up study of adopted children. *Social Service Review*, *42*, 479–499.

Rutter, M., Andersen-Wood, L., Becket, C., Bredenkamp, D., Castle, J., Dunn, J., Ehrich, K., Groothues, C., Harborne, A., Hay, D., Jewett, J., Keaveney, L., Kreppner, J., Messer, J., O'Connor, T., Quinton, D., & White, A. (1998). Developmental catch-up, and deficit, following adoption after severe global early privation. *Journal of Child Psychology and Psychiatry*, *39*, 465–476.

Sattler, J. M. (1982). *Assessment of children's intelligence and special abilities* (2nd ed.). Boston: Allyn & Bacon.

Scheepstra, A. J. M. (1998). *Leerlingen met Downs syndroom in de basisschool*. (Down's syndrome pupils in regular primary schools.) Groningen, The Netherlands: Groningen University (academic dissertation).

Schmitz, S., Fulker, D. W., & Mrazek, D. A. (1995). Problem behavior in early and middle childhood: An initial behavior genetic analysis. *Journal of Child Psychology and Psychiatry*, *36*, 1443–1458.

Sharma, A. R., McGue, M. K., & Benson, P. L. (1996). The emotional and behavioral adjustment of United States adopted adolescents: Part I. An overview. *Children and Youth Services Review*, *18*, 83–100.

Smith, D. W., & Brodzinsky, D. M. (1994). Stress and coping in adopted children: A developmental study. *Journal of Clinical Child Psychology*, *23*, 91–99.

Spiker, D., Kraemer, H. C., Constantine, N. A., & Bryant, D. (1992). Reliability and validity of behavior problem checklists as measures of stable traits in low birth weight, premature preschoolers. *Child Development*, *63*, 1481–1496.

Stams, G. J. J. M., Juffer, F., & Van IJzendoorn, M. H. (1998). *Maternal sensitive responsiveness, infant attachment, and their consequences in middle childhood: The case of adopted children*. Leiden, The Netherlands: Leiden University (manuscript).

Stams, G. J. J. M., Juffer, F., Van IJzendoorn, M. H., & Hoksbergen, R. A. C. (in press). Attachment-based intervention in adoptive families in infancy and children's development at age seven: Two follow-up studies. *British Journal of Developmental Psychology*.

Tizard, B. (1991). Intercountry adoption: A review of the evidence. *Journal of Child Psychology and Psychiatry*, *32*, 743–756.

Tizard, B., & Hodges, J. (1978). The effect of early institutional rearing on the development of 8-year-old children. *Journal of Child Psychology and Psychiatry*, *19*, 99–118.

Van den Oord, E. J., Boomsma, I., & Verhulst, F. C. (1994). A study of problem behavior in 10- to 15-year-old biologically related and unrelated international adoptees. *Behavior Genetics*, *24*, 193–205.

Van Lier, P. A., Haselager, G. J. T., Hoeben, S. M., & Van Lieshout, C. F. M. (1992). *Manual for the NCKS. Dutch translation*. Nijmegen, The Netherlands: University of Nijmegen, ITS.

Van Lieshout, C. F. M., Riksen-Walraven, J. M. A., Ten Brink, P. W. M., Siebenheller, F. A., Mey, J. T. H., Koot, J. M., Janssen, A. W. H., & Cillessen, A. H. N. (1986). *Zelfstandigheidsontwikkeling in het basisonderwijs*. (Competence development in elementary school.) Nijmegen, The Netherlands: University of Nijmegen, ITS.

Verhulst, F. C., Althaus, M., & Versluis-den Bieman, H. J. (1990). Problem behavior in international adoptees: I. An epidemiological study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *29*, 94–103.

Verhulst, F. C., Koot, H. M., & Van der Ende, J. (1994). Differential predictive value of parents' and teachers' reports of children's problem behaviors: A longitudinal study. *Journal of Abnormal Child Psychology*, *22*, 531–546.

Verhulst, F. C., Van der Ende, J., & Koot, H. M. (1996). *Handleiding voor de CBCL/4-18*. (Manual for the Child behavior Checklist/4-18, Dutch version.) Rotterdam, The Netherlands: Erasmus University Rotterdam.

Verhulst, F. C., Van der Ende, J., & Koot, H. M. (1997). *Handleiding voor de Teacher's Report Form-TRF*. (Manual for the Teacher's Report Form-TRF, Dutch version.) Rotterdam, The Netherlands: Erasmus University Rotterdam.

Versluis-den Bieman, H. J. M., & Verhulst, F. C. (1995). Self-reported and parent reported problems in adolescent international adoptees. *Journal of Child Psychology and Psychiatry*, *36*, 1411–1428.

Wadsworth, S. J., DeFries, J. C., & Fulker, D. W. (1993). Cognitive abilities of children at 7 and 12 years of age in the Colorado Adoption Project. *Journal of Learning Disabilities*, *26*, 611–615.

Warren, S. B. (1992). Lower threshold for referral for psychiatric treatment for adopted adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *31*, 512–517.

Wierzbicki, M. (1993). Psychological adjustment of adoptees: A meta-analysis. *Journal of Clinical Child Psychology*, *22*, 447–454.

Manuscript accepted 6 April 2000